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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,944	03/30/2001	Harry Q. Pon	42390P10075	6606

8791 7590 07/01/2002

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EXAMINER
ANDUJAR, LEONARDO

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 07/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/822,944	Applicant(s) PON, HARRY Q.	
	Examiner Leonardo Andújar	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *19-27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Acknowledgment

1. The Amendment filed on 10/09/2001, paper no. 5 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-27.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-18, drawn to a semiconductor device, classified in class 257, subclass 786.

II. Claims 19-27, drawn to a method of manufacturing a semiconductor device, classified in class 438, subclass 612.

3. The inventions are distinct, each from the other because of the following reasons: Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, unpatentability of the Group I invention would not necessarily imply unpatentability of the Group II invention, because the device of Group I invention could be made by a process materially different from that of the Group II invention. For example, the process of claim 20 can be materially altered by deposit the insulating layer over the bond wire without covering its ends.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, the fields of search are not co-extensive and separate examination would be require, restriction for examination purposes as indicated is proper.

5. Applicant is advised that the response to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

7. During a telephone conversation with John Travis on 06/14/2002 a provisional election was made without traverse to prosecute the invention of I, claims 1-18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 19-27 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

8. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 16 recites the limitation "said substrate" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

13. Claims 1-3 and 6-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Horiuchi et al. (US 6,084,295).

14. Regarding claim 1, Horiuchi (e.g. figs. 1-3) shows an apparatus comprising:

- A bond wire 20;
- An insulating material 30 coating the wire bond;
- And a first end of the wire bond connected to a bond pad.

15. Regarding claim 2, Horiuchi discloses that the bond wire is made of gold (col. 4/lls. 26-37).

16. Regarding claim 3, Horiuchi discloses that the insulating material comprises a polymer (col. 4/lls. 26-37).

17. Regarding claim 6, Horiuchi shows that the bond pad is connected to an integrated circuit (abstract).

18. Regarding claim 7, Horiuchi shows that the bond pad is connected to a substrate (e.g. fig. 1).

19. Regarding claim 8, Horiuchi (e.g. figs. 1-3) shows an apparatus comprising:

- A first bond wire 20;
- An insulating material 30 coating the wire bond;
- A first end of the wire bond connected to a bond pad;
- And a second bond wire crossing the first bond wire.

20. Regarding claim 9, Horiuchi shows that the wires comprises an insulating material coating the second wire bond (e.g. fig. 3).

21. Regarding claim 10, Horiuchi shows that the first bond wire touches the second bond wire (e.g. fig. 1).

22. Regarding 11, Horiuchi (e.g. figs. 1-3) shows an integrated circuit assembly comprising:

- An integrated circuit 10;
- A substrate 5;
- A bond wire 20 connected to the integrated circuit and the substrate;

- And an insulating material 30 coating the wire bond.

23. Regarding claim 12, Horiuchi shows that the substrate 5 is a printed circuit board (co. 3/ll. 32).

24. Regarding claim 13, Horiuchi discloses that the insulating material comprises a polymer (col. 4/lls. 26-37).

25. Regarding claim 14, Horiuchi discloses that the bond wire is made of gold (col. 4/lls. 26-37).

Claim Rejections - 35 USC § 103

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

27. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (US 6,084,295).

28. Regarding claim 4, Horiuchi shows most aspects of the instant invention (see comments above), except for the specific insulating coating thickness claimed by the applicant i.e., the thickness of the insulating material on the bond wire is in the range of approximately 0.2 micrometers to 0.6 micrometers. Horiuchi, however, discloses that the thickness of the bond wire is 5 micrometers (col. 4/lls. 26-37). Although Horiuchi does not specify the same insulating thickness as those claimed by the applicants, thickness differences are considered obvious design choices and are not patentable unless unobvious or unexpected results are obtained from these changes. Accordingly,

it would be an obvious matter of design choice to select a suitable thickness for the insulating coating discloses by Horiuchi, since the insulating thickness is variable of importance subject to routine experimentation and optimization and it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 105 USPQ 233, 235. Furthermore, it appears that the insulating differences between Horiuchi and the claimed invention produce no functional differences and therefore would have been obvious. Note In re Leshin, 125 USPQ 416.

29. Applicant's claims 5, does not distinguish over the Horiuchi reference regardless of the process used to connect the wire bond to the bond pad, because only the final product is relevant, not the process of making such ultrasonic bonding. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in " product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. See also MPEP 706.03(e).

30. Claims 15-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (US 6,084,295) in view of Takiar (US 5,422,435)

31. Regarding 15, Horiuchi (e.g. figs. 1-3) shows an integrated circuit assembly comprising:

- An integrated circuit 10;
- A substrate 5;
- A bond wire 20 connected to the integrated circuit and the substrate;
- And an insulating material 30 coating the wire bond.

32. However, Horiuchi does not disclose a second integrated circuit. Takiar (e.g. fig. 5) shows a package comprising a first integrated circuit connected to a second integrated circuit by bond wires. Takiar discloses that this type of embodiment provides a single circuit assembly. Furthermore, Takiar discloses that this type of arrangement is used to decrease the size and weight of the device, as well as to improve its performance (col. 2/lls. 3-9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a second integrated circuit in Horiuchi's invention in order to provide a single circuit assembly having a decreased size and weight as suggested by Takiar.

33. Regarding claim 16 (as understood), Horiuchi shows that the substrate 5 is a printed circuit board (co. 3/ll. 32).

34. Regarding claim 17, Horiuchi discloses that the insulating material comprises a polymer (col. 4/lls. 26-37).

35. Regarding claim 18, Horiuchi discloses that the bond wire is made of gold (col. 4/lls. 26-37).

Conclusion

36. Papers related to this application may be submitted directly to Art Unit 2826 by facsimile transmission. Papers should be faxed to Art Unit 2826 via the Art Unit 2826 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2826 Fax Center number is **(703) 308-7722** or **–7724**. The Art Unit 2826 Fax Center is to be used only for papers related to Art Unit 2826 applications.

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Leonardo Andújar** at **(703) 308-0080** and between the hours of 9:00 AM to 5:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via Leonardo.Andujar@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn, can be reached on (703) 308-6601.

38. Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 305-3900.**

39. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass (es): 257/723, 782 and 786	06/02
Other Documentation:	
Electronic Database(s): East (USPAT, US PGPUB, JPO, EPO, Derwent, IBM TDB)	06/02

Leonardo Andújar
Patent Examiner Art Unit 2826
LA
6/18/02

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